(22 cont.)

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PART I.

ORIGINAL ESSAYS.

ART. VII.—*Notes on some of the Indigenous Medical Plants of India.* By EDWARD JOHN WARING, Esq., Physician to His Highness the Rajah of Travancore.

(Continued from Vol. I. p. 79.)

INDIGENOUS PURGATIVES.

IN commencing an enquiry into the indigenous purgatives of India, our attention is first naturally directed to the four large Natural orders, Euphorbiaceæ, Cucurbitaceæ, Convolvulaceæ, and Leguminosæ, the plants belonging to which yield some of the most important and valuable of the purgatives which hold a place in our Materia Medica.

Commencing with the consideration of the Euphorbiaceæ, we find that India is peculiarly rich in plants of this order; no less than 112 species are enumerated by Roxburgh as known in his time, since when the number is now doubtless greatly increased.

Purgatives of the Nat. Order Euphorbiac æ.

Previous to entering on the consideration of the individual species, we shall briefly notice a few points relative to the purgative operation which a large number of the species possess in common, even though we may have subsequently to notice

some of the same points when speaking of individual species.

1. The purgative principle in Euphorbiaceous plants resides chiefly, or in the greatest intensity, in the fruit, though in some species it is found to exist likewise, though in a minor degree, in the leaves, root, and other parts of the plant; of this we have examples in the *Croton tiglium*, and the *Ricinus communis (infra.)* In some this purgative principle exists in the milky juice; e. g. *Euphorbia antiquorum*, and allied species.

2. It is extremely probable that the purgative principle of all the Euphorbiaceous fruits is identical, and that it exists in the form of an acrid resin, which has been found uniformly present in those specimens which have been subjected to chemical analysis. "The brownish yellow resin," found by Brandes in croton oil seeds, "the acrid principle, probably, resinous," detected by Soubeiran(1) in the castor oil seeds, and "the peculiar fixed acrid resin" detected by the same chemist (Ibid. p. 103) in the seeds of the English physic-nut, (*Jatropha curcas*,) are probably closely allied if not actually identical. This view is strengthened by the similarity in the train of symptoms induced by large or poisonous doses of the seeds of this class of plants. In each we observe hypercatharsis, vomiting, great abdominal pain, cold sweats, great prostration and syncope; *post-mortem* examination disclosing in each case, inflammation of the intestinal canal. As still further corroborating this view, it may be added that in each case copious draughts of lime juice mitigate or remove the ill effects of large or excessive doses.

3. They all likewise contain a greater or less proportion of fixed fatty oil.

4. The differences observed in the operation of these several seeds, (for, as is well known, they differ considerably in their potency of operation,) probably depend upon the proportions of the fixed oil which they respectively contain, and also upon the solvent power of the oil itself. Thus the croton seeds which contain a very small proportion of the fixed oil, are far more powerful in their operation than the castor oil seeds, which contain it in a far greater proportion; whilst the English physic-nut seeds, which contain more oil than the croton seeds and less than the castor oil seeds, hold

(1) Journ. de Pharm. 1829. vol. xv. p. 507.

an intermediate place. The larger proportion of fixed oil found in castor oil seeds may also operate in a degree mechanically, by proctecting the mucous coats of the stomach and intestines from the immediate or too irritant contact of the acrid resinous principle. Further evidence in support of the opinion that the potency of action depends in a great measure upon the solvent power of the fixed oil, is to be found in the fact that after the extraction of the oil, either by expression or coction, the residue or mark retains considerable power as an emetico-cathartic. This was found to be the case with respect to castor oil seeds by M. Collond,(1) and with those of the physic-nut *(Jatropha curcas)* by Prof. Christison.(2)

5. A popular belief exists, which has apparently been held from the earliest ages by Hindu writers, that the acrid emetico-cathartic principle of the Croton, Castor, and English Physic-nut seeds, resides principally, or at least in the greatest intensity, in the cotyledon or embryo. Amongst modern scientific authorities who entertained this opinion may be mentioned Jussieu.(3) It would be an extremely difficult point to settle conclusively, but the following fact is worthy of note as tending to support the popular belief. In the West Indies is an Euphorbiaceous plant, the *Omphalla triandra* or *Hog nut tree*, the kernels of which are described as delicately sweet and wholesome, like the best chestnuts, and the oil expressed from them is bland and inert, whilst we learn from Lunan(4) that the embryo or cotyledon operates as an emetic and purgative. Another fact may be mentioned as bearing on the same point. The kernels of the *Hura crepitans* or *Sand-box tree*, another Euphorbiaceous tree of Jamaica, are in their natural state an extremely acrid emetico-cathartic; but Dr. W. Hamilton,(5) mentions having met with an American captain who was in the habit of constantly carrying about with him some of these kernels, *with the cotyledon carefully removed*, and of these he took four or five in the morning to relieve the bowels, which they did without causing sickness, pain, or griping.

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(1) Lond. Pharm. Journ. 1849, vol. viii, p. 491.
(2) On Poisons, p. 591.
(3) Genera Plant, p. 392. For the views of different authorities on this subject consult also Deyeux in Ann. de Chim. lxxiii, 106. Boutron Charlard et Henri, in Journal de Pharmacie, x, 466. Bussy et Lecanu, Ibid. xii, 481.
(4) Hort. Jamaicensis i, p. 204.
(5) Pharm. Journ. ix, p. 13.

6. The various degrees of potency of the purgative oils derived from plants belonging to this order, have recently been examined by Dr. O. Rorke,(1) who divides them into the following classes :—

Emetico-cathartic Oils.

Oil of Croton tiglium.....	1— 2	drops.
Jatropha curcas.....	8— 12	do.
Euphorbia lathyris.....	15— 30	do.
Anda gomesii (Brazil).....	30— 45	do.
Hura crepitans (West Indies).....	75—150	do.
Ricinus communis.....	1— 2	ounces.

Simply Purgative Oil.

Oil of Aleurites triloba.....	1— 2	do.

Inert Oil.

Oil of Omphalea triandra.....	1— 2	do.

Oils, the properties of which are undetermined.

Elæococca verrucosa.
Stillingia sebifera.

With these long preferatory remarks we will now proceed to enumerate the plants of this order possessed of purgative properties, which are indigenous in India.

The most important purgative of this order is the true *Purging croton*, the *Croton tiglium* of Linnæus, (Sp. Pl. 1426; Roxb. Flor. Ind. iii, p. 682,) *the Croton jamalgota* of Hamilton, (Linnæan Trans. xiv, p. 258,) and the *Cádél avanacu* of Rheede. (Hort. Mal. ii, p. 61, t. 23.) It is generally regarded as the *Granum moluccum* of Rumphius, (Herb. Amb. ii, p. 64, t. 83,) but it is doubtful whether the species he describes and figures does not rightly belong to *Croton pavana. (infra.)* It attains the size of a small tree, 15-20 feet high, and is found in many parts of India, from Assam to Cape Comorin; it is indigenous likewise in Ceylon, Burmah, Java, and the Moluccas. Its Eastern vernacular names are *Jayapala*, (Sans.) *Datoon, Danti, Jay-pal, Jamalgota* (Hind.) *Jypal*, (Beng.) *Habbi slatun*, (Turk.) *Nirvalum kotay*, (Tam.) *Nepalum vittuloo*, (Tel.) *Cádél avanācu*, (Mal.) *Bori*, (Malay.) *Cheraken tscheraken*. (Javan.) *Nepalam, Wayapala*, (Cing.) *Jepalu*, (Canar.) *Kan-na-koh*, (Burm.) *Na-man-tha-lank*, (Siam.) *Khoni-bhi*, (Assam.) *Pateu* (Chin.) All parts of the

Croton tiglium.

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Jamālgotā.

(1) Ann. de Therap. 1859, p. 117.

plant possess acrid properties, but it is only the wood and the seeds which require notice in this place.

The wood *(Lignum pavanæ,* seu *Moluccense,)* was in former times in considerable repute as a drastic purgative, for which purpose it was administered in doses of from grs. iv. to grs. x., broth being the vehicle usually employed. It is described as light and spongy, covered with a thin grey bark, having a nauseous smell, and pungent caustic taste. It is quite exploded in modern practice.

The seeds *(Grana* or *Semina tiglii, Grana tilli, Grana dilla, Grana moluccana, Nuclei pinei moluccani, Tyle berries, Purging nuts,)* appear to have been unknown to the ancient Greek and Roman writers; though Avicenna,(1) and Serapion(2), both describe them under the name of *Dend*, or *Dende.* In the Ulfaz Udwiyeh, they are mentioned under the Arabic name of *Kub-us sulateen;* (No. 755;) and in the Taleef Shereef (No. 439) under that of *Datoon.* The opinion of Mr. Blakesley, (quoted by Drury in his Useful Plants of India, p. 170) that the plant *Sillicypria* and its fruit named *Kiki*, mentioned by Herodotus,(3) refer to *Croton tiglium*, is untenable, as the historian speaks of the plant growing in Greece, which this species of croton does not. It is more probable that a species of Ricinus is meant. The first distinct mention of the seeds is by D'Acosta,(4) in 1578; he speaks of them by the name of *Pini nuceli moluccani*, and he mentions that the seeds are termed by the Canarese *Japala*, (Jayapala) the classical Indian name of the present day. The wood, however, appears to have received much more notice than the seeds, and they fell into disuse till 1813, when Ainslie called attention to them in his Materia Medica of Hindostan. Eleven years subsequently Dr. Conwell published his Recherch. sur les. Prop. Med. de l' Huile de Croton tiglium (8vo. Paris, 824), since which period, the expressed oil of the seeds, croton oil, has been in universal use. Those desirous of investigating the early history of the drug, will find much interesting matter in the learned papers on the subject, by Prof. Wilson,(5) Drs. Adam,(6) Iliff,(7) Frost,(8) and Tavernier(9).

Croton seeds in their natural state are a powerful irritant

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(1) Lib. ii, cap 219.
(2) De Simpl. 348.
(3) Lib. ii, cap 94.
(4) Clusius Exot. p. 292.
(5) Med. Phys. Trans. of Cal. 1, p. 248.
(6) Ibid 1, p. 279.
(7) Lond. Med. Repos. vol. xvii.
(8) Ibid 1822.
(9) Nono Bibl. Med. ix, p. 198.

poison, acting especially on the mucous intestinal lining membrane. Their activity as a purgative depends on the presence of a fixed oil, holding an acrid principle in solution. *(infra.)* In addition to this, they contain a volatile acrid principle, the vapour of which causes great irritation of the eyes, lining membrane of the nares, &c., amongst those engaged in the manufacture of croton oil. The acid, called Croton or Jatrophic acid, which they contain, is inert, as is supposed to be also the peculiar crystallizable principle found in them which has been named Crotonin. It is supposed that a great portion of the acridity of the seeds resides in the seed coat, and in the embryo, and that this is at any rate partially the case, I am induced to believe by the greater mildness with which they operate when these portions have been carefully removed.

Though unfit for internal administration in the natural state, they prove, when properly prepared, a safe and efficacious purgative; for this purpose they are prepared by boiling the seeds three times successively in milk, and after each boiling, drying them well, and carefully removing the outer shell, and the embryo. If the latter is allowed to remain, violent tormina and vomiting are apt to ensue. To 3i. of the seeds thus prepared, 3ii. of catechu should be added and the mass divided into two grain pills, a few drops of Ol. Menth. Pip. may be advantageously added to the mass. This mode of preparation, first proposed by Dr. White,(1) renders the seeds a valuable resource to the Indian practitioner; and Mr. Marshall justly observes—"To the field surgeon it is no unimportant recommendation that 500 doses may be contained in a small wafer-box, and be purchased for half a rupee." I have used these pills in some hundreds of cases, amongst the Burmese, and have generally found their action uniform, producing five or six copious watery stools, and operating within two or three hours after being swallowed. Any excessive operation is almost immediately checked by a draught of lemon juice.

The expressed oil of the seeds, *Oleum tiglii, Crotonis oleum, Croton oil,* varies in colour from pale brown to a dark reddish brown, with a feeble sickly smell, and an acrid persistent taste. Taken internally, in doses of gutt. i-ii-iii., it acts as a powerful drastic purgative; in larg doses it proves poisonous, and Christison(2) quotes a case of a young

(1) Ainslie's Mat. Med. p. 294. (2) On Poisons, p. 593.

man who swallowed two drachms and a half of it by mistake; he was soon seized with tenderness of the belly, violent efforts to vomit, cold sweating, laborious respiration, blueness of the lips and fingers, and an almost imperceptible pulse; then with profuse, involuntary discharges by stool, burning, along the throat and gullet, and insensibility of the skin, and in four hours he expired. The villous coat of the stomach was soft, but not otherwise injured. It appears to exercise a specific influence on the intestinal mucous membranes, as when injected into a vein it has caused death, and the whole of the intestinal canal has been found in a state of inflammation, and when applied to a blistered surface, it speedily induces its cathartic operation. For internal use it may be administered in the form of pill with bread crumbs; or if the patient from any cause be unable to swallow, it may be placed at the root of the tongue, its full purgative action being equally attainable in this latter way.

The smallness of the dose required, the rapidity of its action, and its powerful purgative effect, render it peculiarly valuable in apoplexy and other cerebral affections. In some persons it produces, even when given in small doses, severe hypercatharsis, which has occasionally proved fatal. It is more speedy in its operation than any other cathartic, producing copious watery stools in one or two hours, and sometimes in even a shorter period after its administration. Alkalies are said to modify the acrimony of the oil, without imparing its cathartic properties, and the addition of a small portion of opium diminishes the violence of its action.

Croton oil is especially indicated in cases where it is desirable to produce speedy and strong catharsis; thus in cerebral affections, in coma, apoplexy, mania, &c., its operation is often attended with signal benefit, a drop or two placed at the back part of the tongue, when the patient is unable to swallow, acting with promptitude and energy. In obstinate constipation, colica pictonum, dropsy, &c., it has also been resorted to with the best effects. Of the value of the oil as an external agent we shall have occasion to speak in another place.

Croton polyandrum.
Hāpoon (Hind.)

A closely allied species, *Croton polyandrum* of Roxburgh, (Flor. Ind. iii, p. 682,) the *Croton Roxburghii* of Wallich, the *Baliospermum polyandrum* of Wight, (Icones, vol. v, tab. 1885,) the *Jatropha montana* of Willdenow (Sp. Pl. iv, p. 563,) is a

native of Bengal, extending northward to the banks of the Jumna, and is found also in the Circar Mountains, and in Burmah. Its native names are *Hāpoon*, (Hind.) *Hakooi*, *Duntee*, (Beng.) *Konda amadum*, *Nela-jidi*, (Tel.) *Tha-dee-wa*. (Burm.) The seeds are esteemed by the natives as a good purgative; they administer one, two, or three seeds, bruised up with water, according to the effect they wish to be produced. Some writers consider that these are the real Jamalgota of the Hindūs, whilst others, with more reason, think that Croton tiglium is the plant producing the real drug.

Croton pavana.

The Croton pavana of Hamilton, (Linnæan Trans. xiv, p. 259,) is supposed by this botanist to be the *Granum moluccum* of Rumphius, (op. cit.) the original *Tilly-seed plant*, but the point must be considered as unsettled. It is a native of Ava, the North-Eastern provinces of Bengal, and of Amboyna. The seeds are much smaller than those of the preceding species, but there appears little doubt that they yield a purgative oil, equal, probably, to that of the Croton tiglium.

Croton oblongifolium.

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Chucka.

Croton oblongifolium (Roxb. Flor. Ind. iii, p 685.) is a native of Bengal and Upper India, where it is known by the names of *Chucka*, (Hind.) and *Buro gach*, (Beng.) The fruit is used as a purgative in doses from gr. ½ to grs. iii. (Irvine.)(1)

Jatropha curcas.

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Bagrendī.

The genus *Jatropha* contains two plants of undoubted activity as purgatives; the first in rank of these is the *Jatropha curcas* of Linnæus, (Sp. Pl. 1429,) the *Curcas purgans* of Adanson, *the Castiglionia lobata* of Ruiz and Pavon. It is a common roadside shrub throughout the whole of India, where it is known by the names of *Nepala kanana*, *Kerandum*, (Sans.) *Bagrendī* or *Bagh-berenda*, (Hind.) *Bagh-danana*, (Beng.) *Népálum*, or *Adivie amida*, (Tel.) *Katta amanak*, (Tam.) *Mara hárúlá*, (Can.) *Rata endum*, (Cing.) *Dsharrak-pagger*, (Javan.) *Thembau-kyet-hsoo*. (Burm.) It is not, however, confined to India, but exists plentifully in the tropical por-

(1) Mat. Med. of Patna, p. 128.

tions of Africa, South America, and the West Indies. Its seeds, called the *English* or *American Physic nuts*, or *Barbadoes nuts*, *Gros pignon d'Inde*, (Fr.) to distinguish them from those of the next species, have the shape of castor oil seeds, but are black, somewhat rough to the touch, and are marked with numerous minute cracks. They are accurately figured and described by Guibourt(1) under the name of *Semences de Curcas purgatif.* They have been analyzed by Cadet de Gassicourt(2) and by Soubeiran.(3) The latter chemist found in them a fixed oil, a peculiar fixed acrid resin, saccharine matter, gum, a small quantity of fatty acid, glutine (emulsion), a free acid (malic?) and some salts (Pereira.)(4)

Taken internally they act as a drastic cathartic and emetic; these properties, like those of the Euphorbiaceous plants, already mentioned, reside in a fixed oil which holds a portion of the acrid resin, the true active principle, in solution. The proportion of oil which they contain is very large; thus Guibourt (op. cit.) obtained from 656 grammes of the cleansed kernels no less than 265 grammes of oil, which he describes as colourless, very fluid, and depositing when cold a large quantity of stearine. It differs, he remarks, from castor oil by its very slight solubility in alcohol, not dissolving in 24 parts of absolute alcohol.* The seeds are said to loose much of their violence of action by roasting, but this is doubtful. Mr. Bennett(5) found that four seeds caused a burning sensation in the stomach and bowels, together with violent vomiting and purging, which passed off in the course of a few hours, the burning sensation, however, lasting much longer. Their action is that of a local irritant; as Dr. Christison(6) observes that when applied in the form of powder to a wound, they produce violent spreading inflammation of the subcutaneous cellular tissue; and that when introduced into the stomach, they inflame that organ and the intestines; and he adds that he has known violent vomiting and purging occasioned by a few grains of the cake or residuum left after expression of the fixed oil from the bruised seeds. The same authority, in his Edinburgh Dispensatory, (p. 794) states that he instituted some experi-

(1) Hist. des Droques ii, p. 334.
(2) Journ. de Pharm. t. x, p. 176, 1824.
(3) Ibid, t. xv, p. 503, 1829.
(4) Mat. Med. ii, p. 1293.
(5) Lond. Med. Gaz. ix, p. 7.
(6) On Poisons, p. 591.

* For a further account of the chemical history of this drug see Chemial Gazette, December 15th, 1854, p. 469.

ments with this oil; that one dose from Barbadoes seeds acted precisely like castor oil, in doses of gutt. x—xv, or xx, but that another, from Jamaica seeds, sometimes caused the same severe sickness and watery evacuations as castor oil, and at other times was inert, in doses of gutt. xxx. This want of uniformity in operation is a great drawback to its general employment as a purgative. The leaves in decoction, according to Dr. Wright(1) are often used with advantage in spasmodic bellyache, attended with vomiting; he adds that they sit more easily on the stomach than anything else, and seldom fail to act upon the bowels.

Jatropha multifida.

The second species, the *Jatropha multifida* of Linnæus, (Sp. Pl. p. 1429,) the *Curcas multifida* of Endlicher, the *Adenorhopium multifidum* of Pohl, is a native of South America, but is now quite domesticated in India, where it is commonly cultivated in gardens under the name of the *Coral bush*, from the coral-like appearance of its inflorescence. By the French it is designated *Petit medicinier*, or, *Medicinier d'Espague*. Its Eastern names are *Kattu nervalam*, (Tam.)

The seeds *(French Physic nuts, Avellanæ purgatrices)* are well described and figured by Guibourt(2) under the name of *Semences de Mediciner multifide*, and they are stated by Soubeiran(3) to be identical in composition with the preceding species; the action of *C. multifida*, however, appears to be more energetic, and death is said to have resulted from an over dose. Taken internally, in doses of three to five seeds, they act powerfully as a drastic purgative and emetic. Barham(4) states that the best mode of preparing them for administration is to roast them, to remove the outer skin and the embryo, and to steep them in Madeira wine, when it is said "they will purge well all gross humours." Lindley(5) states that the seeds are one of the best of all emetics and purgatives, acting briskly but without inconvenience, and that their effects are readily stayed by the administration of a glass of good white wine. I am at a loss to ascertain the authority on which this statement is based.

(1) Med. Plant of Jamaica.
(2) Hist. des Droques Sunp. ii, p. 335
(3) Op. cit.
(4) Hort. Amer. p. 144.
(5) Flor. Medica, p. 185.

Jatropha glandulifera, and Jatropha glauca.
A'dalei, (Tam.)

Two other species, if indeed they are not identical, *Jatropha glandulifera*, Roxburgh (Flor. Ind. iii, p. 688,) and *Jatropha glauca*, (Vahl. Symb. 1, p. 79) are commonly found in Southern India, on the bunds of paddy fields, tanks, &c. They are each called *A'dalei* by the Tamuls, and *Nela-ameda* by the Telingees. The seeds yield a stimulant oil, which is employed as an embrocation in rheumatic and paralytic affections. Ainslie[1] makes no mention of its internal use, but in Travancore, I find on enquiry, that the oil obtained by coction, and the prepared seeds themselves, are employed as a purgative by the natives.

The root of *Janipha manihot*, Kth. the *Tapioca plant*, in its fresh state produces amongst other symptoms hypercatharsis, but it is not employed medicinally in this character, and is more properly ranged amongst the poisons.

Ricinus communis.
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Aranḍ.

The next plant of this Natural order which we have to consider, is so well known that any lengthened description of it in this place is uncalled for, viz., the *Castor oil plant, Ricinus communis* of Linnæus, (Sp. Pl. 1430; Roxb. Flor. Ind. iii, p. 689,) the *Ricinus albus, et ruber* of Rumphius, (Herb. Amb. iv, p. 92, t. 41.) the *Avanacu* or *Cit-avanacu* of Rheede, (Hort. Mal. ii, p. 57, t. 32,) and the *Arnd* of the Taleef Shereef (p. ii, No. 34.) Its Oriental names are *Eranda*, (Sans.) *Khiroa-cherna*, (Arab.) *Bed-injir*, (Pers.) *Arand, Arindi*, (Hind.) *Bherunda*, (Beng.) *Khyroa*, (Turk.) *Avanacu*, (Mal.) *Sitamanakhu cheddie, Valakindu*, (Tam.) *Amudam chettu*, (Tel.) *Haralu urraloo*, (Canar.) *Kyet-hsoo*, (Burm.) *Endooroo*, (Cing.) *Dsharak*, (Javan. and Malay,) *Pi-ma, Ho-ma*, (Chin.) *Cay-du-dudeau*, (Coch.-Chin.) It was well known to the ancients, and has been identified with the κίκι or κρότον of Dioscorides,[2] and with the *Ricinus* of Pliny.[3] It is also supposed by some commentators to be the *Kikayon* of Scripture, (Jonah, iv, 6.) which in the English version is translated gourd.[4] The description given by Dioscorides of κίκι leaves no room to

(1) Ainslie Mat. Ind. ii, p. 6.
(2) Mat. Med. Lib. iv, cap. 164.
(3) Hist. Mat. Lib. xv, cap. 7.
(4) See an exeellent article on this by Royle in Kitto; Cyc. of Biblical Literature ii, p. 203.

doubt its idenity. He describes the seeds as being called by some *Ricinus*, from their similarity to an insect so named by the ancients, the *Tick* of the present day; he also clearly describes the expressed oil, (κίκινον) which he states operates as a purgative and emetic.

In their raw or fresh state, the seeds, like those of other Euphorbiaceæ generally, possess acrid properties. Two or three of the seeds will operate as a violent cathartic. Berguis, as quoted by Orfila, says he knew a stout man who was attacked with profuse vomiting and purging after having masticated a single seed.(1) Lanzoni met with an instance where three grains of the fresh seeds, taken by a young woman, caused such violent vomiting, hiccup, pain in the stomach, and faintness, that for some time her life was considered in great danger. Mr. Alfred Taylor met with three cases of poisoning with castor oil seeds. Two sisters, who took each from two to four seeds, suffered severely; and a third, who took twenty, died in five days, with symptoms like those of malignant cholera. Climate, however, appears to affect their activity. Christison(2) states that he has known a person eat without any effect several seeds ripened in the open air in the neighbourhood of Edinburgh. Copious draughts of lime juice mitigate or remove any poisonous symptom. The root or bark of the root appears also to possess a purgative property. It was this part of the plant which was employed by Hippocrates,(3) and at the present day it is used in Travancore as a purgative in the form of infusion, about an ounce of the root being considered as a sufficient dose for a child, and double or treble that quantity for an adult; it is likewise administered in flatulence.

Castor oil seeds are at the present day chiefly valued for their oil, *(Castor oil, Oleum ricini,)* of which they contain a large portion. According to Geiger(4) they yield no less than 46 per cent. of their weight of oil. Of the three modes adopted for the extraction of the oil, expression, coction, and the action of alcohol, the first is most highly esteemed by British practitioners, and it is certain that it is vastly superior to the oil prepared by coction, being clearer, brighter, of a pleasanter taste, and less irritant in its operation. It

(1) Quoted by Marx, die Lehre von den Giften 1, 128.
(2) On Poisons, p. 590.
(3) De Nat. Muliel. Ed. Fæs. p. 573.
(4) Vol. et Arch. Dict. des Anal. Chim. ii, p. 252.

is very probable that the heat employed in the process of coction increases the solvent powers of the fixed oil, and hence that it contains a larger proportion of the acrid resinous principle than it would have done if no heat had been employed. With regard to the third process, the extraction of the oil by means of alcohol, this has been chiefly practised in France and Italy. It is asserted to be less disagreeable to the taste and more effective than the common oil, but more readily becomes rancid. According to M. Parola, an ethero-alcoholic extract, and an etherial or alcoholic tincture of the seeds, operate in much smaller doses than the oil, and with less disposition to irritate the bowels or to cause vomiting.*

Neither pressure nor alcohol suffice for the extraction of the whole of the active principle; the researches of M. Collond(2) demonstrate that after the seeds have been subjected to powerful pressure, and likewise after they had been exhausted of every thing soluble by boiling alcohol, the cake or mark which remains after each process retains powerful emetico-cathartic properties. The subject desires further investigation.

With regard to the medicinal uses and therapeutic applications of castor oil, nothing is required to be said in this place, they are too well known to require repetition, and may be found in detail in any systematic works on Materia Medica.†

All the preceding indigenous purgatives of this Natural order which we have enumerated, have a more or less well established character, and have for ages been employed both in Indian and European practice. The next to which we would call attention is a comparatively new one, the *Aleurites triloba* of Forster, (Roxburgh, Flor. Ind. iii, p. 629,) the *Camirium cordifolium* of Gartner, (De Fruct, p. 195, tab. 125, fig. 2,) the *Juglans camirium* of Lowreiro, (Flor. Coch. p. 573,) *the Camirium of* Rumphius. (Herb. Amb. ii, tab. 58.) This large handsome tree, often called by English residents *Belgaum*

Aleurites triloba.

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Akhrot.

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* Wood and Bache U. S. Disp. p. 540.

(2) Pharm. Journ. viii, p. 491.

† *Note.*— It is always desirable to be aware of the prejudices of the Natives, however absurd they may seem to us; hence it may be as well to mention in this place, that there exists amongst all classes of natives, Mus-

or *Indian Walnut tree*, exists not only in many parts of India, especially about Belgaum, but in the Malayan Peninsula, the Moluccas, the Friendly and Feejee Islands, Ceylon, &c. Its Oriental names are *Akhrot, Kukrot,* (Hind.) *Ukhrot,* (Beng.) *Kokuna,* (Cing.) *Akhrote,* (Mal.) *Camiri,* (Jav.) The kernels or seeds, which are regarded as stimulant and sudorific by the people of Northern India,(1) and as aphrodisiac by the Malays,(2) contain a very large quantity (from 50 to 60 per cent.) of a very pure oil, which, according to the Report of the Madras Drug Committee,(3) is superior to linseed oil, and likely to become important as an article of commerce. When obtained by expression it is very limpid, of an amber colour, tasteless, inodorous, insoluble in alcohol, easily saponifiable with alkalies, and very drying (siccative). Its medicinal properties have of late been examined by Dr. O'Rorke(4). He exhibited it in doses of one to two ounces, and found that it acted as a very mild and safe purgative, producing in from three to six hours after being taken free bilious coloured stools, unattended by either nausea, colic, or any other ill effects. Indeed in this respect it was found to differ from the oil of all the other Euphorbiaceæ, inasmuch as it acts as a simple purgative, its action being unattended by any degree of either nausea or vomiting. He regards the action of this oil as approximating to that of the fatty oils, but exercising a more stimulant action on the muscular coat of the intestines ; hence he considers that it is adapted to the so called bilious affections attended by torpor of the intestines. Both as a cholagogue and cathartic its operation is mild, and it appears to act successively on the whole length of the intestinal canal. It approaches nearly to castor oil in the mildness and certainty of its operation, but it is superior to it as possessing greater fluidity, as having neither taste nor smell, and as producing its purgative action without causing nausea, whether administered in emulsion or in a pure state. If further experience proves the correctness of Dr. O'Rorke's views, it is probable that this oil may soon hold a high place in the Materia Medica.

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sulmans and Hindus alike, *a very strong prejudice against taking or administering a dose of castor oil on a wet morning.* Taken under such circumstances they entertain a strong belief that it will cause convulsions, and if you endeavour to persuade them of the groundlessness of their fears, they will adduce numerous instances of their own experience in which such results have followed. Many respectable East Indians share in the belief.

(1) Irvine Mat. Med. of Patna, p. 51.
(2) Rumphius, Op cit.
(3) Mad. Med. Rep. 1855, p. 428.
(4) Ann. de Therap. 1859, p. 117.

In all the Euphorbiaceous plants which we have as yet mentioned, the active purgative principle has been found to exist, at least in the greatest intensity, in the fruit ; in those which we are next to notice, the true Euphorbia, it exists in the milky juice of the plant. It is the inspissated milky juice which constitutes the *Euphorbium* "*Euphorbii gummi*" of old writers.(1) It is a medicine of considerable antiquity. Dioscorides(2) describes its acrid properties, and many of the early Arabian writers speak of its virtues as a drastic purgative in dropsy and other affections. It has fallen into entire disuse in European practice, from the powerful character of its operation and the uncertainty of its effects ; but it still holds a place in the practice of the Mussulman doctors of India. It is the *Fir-fe-yoon* or *Fir-be-yoon*, (No. 1210,) and the *U-keil-nefseh* (No. 254) of the Ulfaz Udwiyeh.

It is yet undetermined what species yield this drug; formerly it was attributed to the *Euphorbia antiquorum* of Linnæus, (Sp. Pl. 646,) *the Schadid calli* of Rheede, (Hort. Mal. ii, p. 81, t. 43,) but that such is the case is denied by Hamilton,(3) and Royle,(4) at least as far as India is considered. It is a common plant throughout India, and is known by the names of *Sehund*, *Tidari*, (Sans.) *Zakoon*, (Arab.) *Nar-sij*, *Tedhara*, (Hind.) *Nara-sij*, (Beng.) *Shaddray callie*, (Tam.) *Bontajemmodoo*, (Tel.) *Schadid-calli*, (Mal.) *Sudu-sudu*, (Malay.) Like others of the same family, it abounds with a milky juice which is extremely acrid and irritant. Ainslie(5) informs us that this juice with sesamum oil, is used externally in rheumatism, and locally in toothache, and that when diluted, it is given internally in constipation connected with diseases of the spleen and liver. Rheede also mentions that on the Malabar Coast, the bark of the root, bruised, is taken in water as a purgative. In the Taleef Shereef (p. 105) it is stated to be pungent, and laxative, to increase appetite, to be an antidote to poisons, and to cure dropsy, affections of the spleen, marasmus, &c. The juice evidently possesses active purgative properties.

Euphorbia antiquorum.

تدهارا

Tidhārā.

(1) A long account of it will be found in Murray's Apparatus Medicaminum, Ed. 1787, vol. iv, p. 88.
(2) Mat. Med. Lib. iii, cap. 96.
(3) Trans. Linn. Soc. xiv.
(4) Illust. I, p. 328.
(5) Mat. Ind. I, p. 121.

Harris[1] states that in ostrich hunting in South Abyssinia, the hunter poisons his arrows with the juice of this plant, which does not make the meat injurious.

Euphorbia Nerriifolia.

تهوهار

Thūhar.

The *Euphorbia nivulia* of Buchanan, (Sprengel, Syst. iii, p. 787,) the *Euphorbia Neriifolia* of Linnæus, (Roxb. Flor. Ind. ii, p. 467,) *the Ella-cullie* of Rheede, (Hort. Mal. ii, p. 43,) is common in dry sterile sites in most parts of India. Its Eastern names are *Puttakarie, Sij,* (Sans.) *Sij,* (Beng.) *Thūhar, Ptoon,* (Hind.) *Yileikalli,* (Tam.) *Aku-jemudu,* (Tel.) *Ella-culli,* (Mal.) *Susuru,* (Jav.) *Daum-sudu-sudu,* (Malay,) *Paluk.* (Cing.) The juice of the leaves, which has a somewhat acrid taste, is stated by Ainslie[2] to be employed by native practitioners as a purgative and deobstruent, in those visceral obstructions and dropsical affections which supervene upon long continued intermittent fever, the dose being about a quarter of a pagoda weight. (13 grains.) According to Rheede (op. cit.) the bark of the root boiled in congee water and arrack, is employed by the people of Malabar as a remedy in dropsy. Horsefield also enumerates it amongst the indigenous cathartics of Java.

Euphorbia tortilis.

پيلي سيندڈ

Peelie saynd.

Another species, *Euphorbia tortilis* of Rottler, is common in most parts of the Peninsula, where it is known by the names of *Peelie saynd,* (Duk.) *Tirrughu calli,* (Tam.) *Tirrughu jemenúdú.* (Tel.) Its milky juice is considered by the Hindu doctors as a very drastic cathartic, in doses of about two gold fanams weight, *i. e.*, about ten grains, in conjunction with palmyra jaggery. In its undiluted state it is highly acrid and caustic (Ainslie.)[3]

Belonging to the same Natural order are the following plants, which have some repute amongst the natives as purgatives or aperients. 1, *Embelica officinalis* of Gærtner, (Wight's Icones, v, tab. 1896,) *Phyllanthus embelica* of Linnæus, (Roxb. Flor. Ind. iii, p. 671,) *Nelli-ca-marum.* (Rheede, Hort. Mal. 1, p. 69, t. 38.) It attains the size of a large tree, and extends

Embelica officinalis.

آنولا آملك

Anolā āmlā.

(1) Mat. Ind. ii, p. 97.
(2) Highlands of Aethiopia ii, p. 407.
(3) Ainslie Mat. Ind. ii, p. 425.

from Malabar, northwards to the banks of the Jumna. Its Eastern names are *Aiola, Anula, Amla,* (Hind.) *Amla,* (Beng.) *Nellie-kai-marum,* (Tam.) *Wusheri-kaia-mauno,* (Tel.) *Kattu karamba.* (Cing.) Its fruit constitutes the Embelic Myrobalans of old pharmacologists. In the fresh state they are very acrid and purgative, but by keeping, they lose these properties and become astringent. The yellow flowers of this tree, *Nellie poo,* (Tam.) *Wúsheri-kai poo,* (Tel.) *Anooli ka phul,* (Hind.) have an odour much resembling that of lemon peel, and are supposed by the Hindu doctors to be refrigerant and aperient, and in this character are prescribed in conjunction with other articles in the form of electuary, (Ainslie.)(1) We shall have to refer to the fruit again, both as an astringent and antiscorbutic.

Acalypha Indica.

كوئي كي جنے

Koohie ke-jurr.

A common weed during the rains in most parts of India is a small Euphorbiaceous plant, *Acalypha Indica,* (Linn. Roxb. Flor. Ind. ii, p. 675.) According to Rheede, (Hort. Mal. x, p. 163, tab. 82,) who mentions it under the name of *Cupameni,* the root bruised and taken in water, is cathartic, and the bruised leaves laxative. Its Eastern names are *Koohie ke-jurr,* (Hind.) *Mookto-joori,* (Beng.) *Kuppei-mene,* (Tam.) *Coopoo mayne,* (Can.) and *Kupamenya,* (Cing.)

The next Natural order which requires notice, Cucurbitaceæ, contains many valuable purgatives. Upwards of 160 species exist in various parts of the East Indies. Of these, as possessing purgative properties, the following appear to deserve notice in this place.

Cucumis (Citrullus) colocynthis.

اندرائن

Indrāyan.

The first in importance, its properties having been well ascertained by experience in European practice, is the true Colocynth plant, *Cucumis colocynthis* of Linnæus, (D. C. Prod. iii, p. 302; Roxb. Flor. Ind. iii, p. 719; Wight's Icones, ii, t. 498,) the *Citrullus colocynthis* of Schrader. Its Eastern synonyms are *Indrāvaruni, Vishala,* (Sans.) *Alhandla, Hanzil,* (Arab.) *Hindivane tulkh,* (Pers.) *Bislambha, Indrain, Indrayan,* (Hind.) *Makhal,* (Beng.) *Peykumutti,* (Tam. and Mal.) *Putsakaia,* (Tel.) *Pitta commodoo,*

(1) Mat. Ind. ii, p. 214.

(Cing.) This plant has a wide range, extending from Southern Europe and the Islands of the Mediterranean, throughout Turkey, Egypt, Syria, Abyssinia, Nubia, the greater part of India, to Japan; it is also found at the Cape of Good Hope. It is generally admitted to be the *κόλοκυνθὶς ἀγρία* of Dioscorides(1) and other Greek writers, and the *Colocynthis* of Pliny(2); and it is supposed to be the Wild Vine producing the Wild Gourd *(Pakkoth)* of Scripture.(3) It is the *Inderain* of the Taleef Shereef, (p. 19, No. 74,) and the *In-dera-yen*, (No. 306,) and the *Kunzil*, (No. 817,) of the Ulfaz Udwiyeh. In the last work, *Hud-uj* (No. 782) is given as the Arabian name of the dried fruit, and *Shehum-hunzel* (No. 1086) as that of the dried pulp.

The pulp of the dried fruit, *Colocynth* or *Coloquintida*, is the only part employed in medicine; it is of a dullish white or yellowish colour, without odour, but with a peculiarly nauseous, bitter taste; it is very tough, and is with difficulty reduced to powder. Very opposite statements have been made with regard to the seeds. De Candolle(4) speaks of them as bland, demulcent, and of an oily nature; and they are said by Capt. Lyon to form an article of diet in Northern Africa. Pereira, who cites these authorities, remarks that these statements do not apply to the colocynth seeds of commerce, which he never found devoid of bitterness; and he adds that Hillefeld(5) found a scruple of them purge a dog, and that Heise(6) found them poisonous. With regard to the seeds of the colocynth grown in Southern India, I have frequently tried various specimens, and found them uniformly bitter. The Travancore doctors express an oil from them, which they use as an anthelmintic.

The powdered pulp in doses of grs. iv—x, is a powerful drastic hydrogogue cathartic, but from its extreme acridity it is rarely given uncombined with carminatives. Its acridity depends upon its bitter principle, *Colocynthine*, of which it contains about 14 per cent. Although its action appears to be directed chiefly to the lower portion of the intestinal canal, on which it acts not only by stimulating the secretion, but by increasing the vermicular motion, it appears to act as a stimulant to the other abdominal viscera

(1) Mat. Med. Lib. iv, cap. 178.
(2) Hist. Nat. Lib. xx, cap. 8.
(3) 2 Kings, chap. iv, v. 59.
(4) Essie sur les Prop. Med. des Plantes. p. 191.
(5) Marx. Lehre v. d. Giften ii. p. 27.
(6) Ibid. p. 34.

generally, and not unusually causes an increase in the urinary secretion. That it exercises a specific influence on the intestinal canal is evident from the fact, that the pulp applied to an ulcerated or abraded surface, will act as a brisk purgative. M. Salgues,(1) indeed, proposes to employ it endermically. He directs 30 centigrammes of the finely powdered colocynth pulp to be applied to a blistered surface, and he states that by this means, may frequently be obtained "*un effet purgatif très prononcé.*" Its active principle is therefore absorbed, and Orfila mentions the case of a man, in whom the application of two drachms of the pulp to the cellular tissue of the interior of the thigh, caused death in 24 hours. Christison(2) quotes several cases in which fatal results followed its use in large quantities; in one of these, the intestines, on dissection, were found red, studded with black spots, and matted together by fibrinous matter; the usual fluid of peritonitis was effused into the abdominal cavity, the villous coat of the stomach was here and there ulcerated, and the liver, kidneys, and bladder, also exhibited traces of inflammation. The officinal compound extract, and compound Colocynth Pill in doses of grs. v—xv, are the most eligible forms for internal use; and to further obviate the tormina, nausea, and other ill effects, it may be combined with camphor, which is said to increase its purgative operation, whilst at the same time, its influence on the sentient nerves is greatly diminished. Henbane likewise modifies its operation on the bowels. It is sometimes employed in the form of enema. (Extract of Colocynth, ʒ ss; soft soap, ℥ i; water, Oi.) None of the preparations of colocynth are admissible in acute inflammatory affections of the stomach or bowels.

The two next species are closely allied, both in botanical characters and medicinal properties, to the preceding.

Cucumis pseudo-colocynthis.

« *Cucumis pseudo-colocynthis,* (Royle, Illust. vol. 1, p. 22, tab. 47, f. 2,) a native of the plains of Northern India, where it is called *Indrayan* and *Bisloombhee.* The fruit is similar in quality to colocynth, and is substituted in Northern India for the true article. O'Shaughnessy(3) states that on examining specimens of the *Bislombhee* and *Indrayan* from Delhi, he found

(1) Ann. de Therap. 1845, p. 154.
(2) On Poisons, p. 595.
(3) Beng. Disp. p. 345.

them to correspond in every respect with the description and characters of the true colocynth. There can be no doubt, he adds, that the real colocynth exists in the Doab and in Guzerat, and is called by the names applied by Dr. Royle to his *C. pseudo-colocynthis*, but it is equally evident that Royle's article is a peculiar species, perhaps more abundant than the genuine kind.

Cucumis Hardwickii.

β Cucumis Hardwickii. (Royle, Illust. i, p. 220, tab. 47, fig. 3.) This species was found by Royle at the foot of the Himalayas, where it is called *Puharee Indrayun* or *Hill colocynth*, its name in the Kumaon mountains, where it was observed by Madden, is *Air-aloo;* the term *Indrain* (or *Indrayan)* being appropriated to *Trichosanthes palmata*. Its operation is purgative, similar to that of colocynth.

پہاڑی اندرایں

Puharee Indrayan.

Luffa amara.

Kerula. (Hind.)

Belonging to the same Natural order is the *Luffa amara* of Roxburgh, (Flor. Indica, iii, p. 715; Wight and Arnott, Prod. i. p. 343,) the *Luffa plukenetiana* of De Candolle (Prod. iii, p. 302.) It is common in most parts of India, where it is known by the names of *Kerula*, (Hind.) *Tito-dhoondool*, (Beng.) *Sheti-beera.* (Tel.) Every part of it is extremely bitter; the fruit is violently cathartic and emetic, as are also the ripe seeds, taken either in infusion or in powder (Roxburgh.)

Luffa bindaal.

بندال

Bindaal.

Another species, *Luffa bindaal*, (Roxb. Flor. Ind. iii, p. 717,) is a native of Northern India, where, it is well known by the Hindústani name of *Bindaal.* It is employed by the natives as a powerful drastic purgative in cases of dropsy. (Royle.) It is probably the *Bindaal* of the Taleef Shereef (p. 44. No. 216) to which Playfair has assigned no botanical name.

Luffa acutangula.

جھینگا

Jhingā.

A third species is *Luffa acutangula* of Roxburgh, (Flor. Ind. iii, p. 713; Wight and Arnott, Prod. i, p. 344,) *Cucumis acutangula* of Linnæus, (Sp. Pl. 1436,) the *Turai* of the Taleef Shereef, (p. 63, No. 322.) It is common throughout India, being much cultivated for the sake of its fruit, which enter largely into

native curries. Its common names are *Tarvi-ghia,* (Arab.) *Jhinga tooroi,* (Hind.) *Jhingo,* (Beng.) *Beer-kai,* (Tel.) *Peekum kai,* (Tam.) *Peechenggah,* (Mal.) and *Tha-bwot-kha-wai,* (Burm.) The root, according to Rheede(1) is purgative. In the Mauritius, also where it is known by the name of *Papangaye,* the seeds have this character assigned to them. It is said that about fifteen seeds after being peeled, are sufficient to produce active purgation, and that they are a common remedy amongst the Creoles. They also excite vomiting. (Bouton.)(2) The account given of it in the Taleef Shereef (op. cit.) is lengthy but confused, and has reference more to its dietetical than its medicinal virtues.

The genus *Trichosanthes,* belonging to this order, contains a few plants possessed of purgative properties ; of these we may mention *Trichosanthes dioica* of Roxburgh, (Flor. Ind. iii, p. 701,) the *Pulwul* of the Taleef Shereef, (p. 41, No. 193,) *Pulvul,* (Hind.) *Bun-putol,* (Beng.) It is commonly cultivated in Bengal and other parts of India for the sake of its unripe fruit and tender tops, which are much eaten by the Natives in curries, and are reckoned very wholesome. It is characterised by Revd. J. Long(3) as a useful purgative, and O'Shaughnessy(4) describes the alcoholic extract of the unripe fruit as a powerful and safe cathartic, in doses of three to five grains, repeated every third hour till the desired effect is produced. According to Prof. H. H. Wilson(5), the oldest writers on Hindu Medicine placed much confidence in this plant in the treatment of leprosy.

Trichosanthes dioica.

پلول
Pulvul.

Trichosanthes laciniosa of Klein, (Wild. Sp. Pl. iv, p. 601,) and *Trichosanthes cucumerina* of Linnæus, (Roxb. Flor. Ind. iii, p. 702,) are considered by Wight and Arnott (Prod. i, p. 350,) to be simply varieties of the same plant. Both have purgative properties assigned to them. Speaking of *T. laciniosa,* Ainslie(6) states that the tender shoots and dried capsules are a very bitter aperient, and are reckoned amongst the stomachic lax-

Trichosanthes laciniosa and T. cucumerina.

(1) Hort. Mal. viii, t. 6.
(2) Med. Plants of Mauritius, p. 63.
(3) Journ. Agri-Hort. Soc. of India, 1858, vol. x, p. 4.
(4) Beng. Dispensatory, p. 351.
(5) Trans. Med. Phys. Soc. of Calcutta i, p. 42.
(6) Mat. Ind. vol. ii, p. 296.

ative medicines of the Tamuls, who prescribe them in infusion to the extent of two ounces twice daily. He adduces *Patota*, (Sans.) *Chaynd-polla*, (Tel.) and *Pepoodel*, (Tam.) as its Eastern synonyms. The Burmese know *T. cucumerina* by the name of *Tha-bwot-kha*.

The Natural order Convolvulacea, to which we next direct our attention, is rich in purgative yielding plants. The *Ipomœa jalapa*, which yields the officinal jalap, and the *Convolvulus scammoni*, the source of the well known scammony, belong to this family. Some of the species indigenous in India, though not of such established repute in Europe as the two just named, are possessed of no mean value as cathartics. We may instance the following.

Ipomœa turpethum.

Turbad or Turbid.

The Ipomœa turpethum of R. Brown, (Prod. p. 489,) the *Convolvulus turpethum of* Linnæus, (Sp. Pl. p. 221,) and Roxburgh, (Flor. Ind. 1, p. 476,) *the Spiranthera turpethum* of Bojer. (Hort. Maurit. p. 226.) Excellent plates of this plant will be found in Wight's Illustrations, Suppl. t. 38; Botanical Magazine, t. 2093, and Ker's Bot. Register, t. 279. This twining plant has a wide range, being found not only in many parts of the East Indies, but also in Ceylon, the Malayan Archipelago, New Holland, the Friendly Islands, Otahetie, &c. Its Eastern names are *Trivrit*, *Teori*, *Triputa*, (Sans.) *Turbud*, *Turbad*, (Arab. and Pers.) *Turbad or Turbid*, *Niswit*, (Hind.) *Teooree*, *Trivrit*, (Beng.) *Shevadi or Sivadi kodie*, (Tam.) *Tella-tagada*, (Tel.) *Trasta-wala*, (Cing.)

Its root *(Radix turpethi)* called by old writers *Vegetable turpeth*, to distinguish it from the old *Mineral turpeth, (the Yellow sulphate of Mercury)*, has from the earliest ages been in use as a purgative in the East, Avicenna, (Lib. ii. 2, 557.) Serapion, (De Simpl. 337) Halay Abbas, (Pract. ii, 2. 557,) Mesue the younger, (De Simpl. ii,) and other Orientals, notice it, but it appears to have been unknown to the Greek and early Roman writers. (See Adam's Comment on Paulus Ægineta, iii, p. 445.) By some it has been erroneously identified with the *Tripoilum* of Dioscorides.

Though it has fallen into disuse in European practice, it still continues a favourite purgative in the East, both amongst Hindus and Mussulmans. Roxburgh (op. cit.) has a long note on the medicinal virtues of this root, and adduces the experience of Drs. Wallich, Glass, Gordon, and others, in its use.

Dr. Gordon speaks of it in the following terms. "The roots are long, branchy, somewhat fleshy, and when fresh, contain a milky juice, which quickly hardens into a resinous substance, altogether soluble in spirits of wine. The milk has a taste at first sweetish, afterwards slightly acid, the dried root has scarcely any perceptible taste or smell. It abounds in woody fibres, which, however, separate from the more resinous substance in pounding, and ought to be removed before the trituration is completed. It is in fact in the bark of the root that all the purgative matter exists. The older the plant the more woody is the bark of the root, and if attention be not paid in trituration to the removal of the woody fibres, the quality of the powder obtained must vary in strength accordingly. It is probably from this circumstance that its character for uncertainty of operation has arisen, which has occasioned its disuse in Europe. An extract, which may be obtained in the proportion of one ounce to a pound of the dried root, would not be liable to that objection. Both are given in rather larger proportion than jalap. Like it, the power and certainty of its operation are very much aided by the addition of cream of tartar to the powder, or of calomel to the extract. The powder in this form has been found to operate with a very small degree of tenesmus, and very freely, producing three or four motions within two or four hours. It is considered by the natives as possessing peculiar hydrogogue virtues, and it has been used with decided advantage in the first stages of febrile affections. O'Shaughnessy,(1) however, states that he subjected it to careful clinical experiment, and he feels warranted in asserting that it is so extremely uncertain in its action that it does not deserve a place in the Pharmacopœia. It would have been more satisfactory if some of the observations on which this statement is based had been given in detail. The dose in powder is 3 ss.—3 i. of the root, in infusion ʒ ii.—ʒ iii. of the extract grs. x, ϑ i.

The root, on analysis by Boutron, Charlard,(2) was found to contain resin fatty matter, volatile oil, vegetable albumen, starch, yellow colouring matter, the oxide of iron, (a trace) salts, and woody fibre.

Two other indigenous species of Ipomæa have purgative properties assigned to them.

(1) Bengal Disp. p. 504.
(2) Jour. de Pharm. viii, p. 121.

Ipomœa reptans.

كلمي

Kalmi.

Ipomœa reptans of Poiret (D. C. Prod. ix, p. 349.) *Ipomœa repens* of Roth, (Nov. Spec. p. 110,) *Convolvulus reptans* of Linnæus, (Sp. Pl. 225,) *Convolvulus repens* of Willdenow, (Roxb. Flor. Ind. ii, p. 68,) *Olus vagum* of Rumphius (Herb. Amb. v, p. 419, t. 155, f. 1,) and *Ballel* of Rheede. (Hort. Mal. xi, p. 107, t. 52.) It is chiefly found on sandy shores near the sea coast, not only in the East but also in the West Indies. Sloane,(1) speaking of the West Indian plant, describes it as a hydrogogue purgative, serviceable in dropsical cases, administered either in powder or with broth ; but he adds that its operation is strong, and consequently unsuitable for persons in a weak state. Descourtils(2) likewise states that in the West Indies the juice is employed in doses of gutt xx—xxx, combined with other aperients or some preparations of iron, in the treatment of affections of the liver. The natives of India use the tender tops and leaves, when cooked, as a pot herb.

Ipomœa pes caprœ.
Dapatie lata, (Hind.)

The second species is the well known *Ipomœa (Convolvulus) pes caprœ, the Goat's foot creeper* or *Sea bind weed,* which is one of the most common sand-binding plants in most portions of the tropical portions of both hemispheres. Its Eastern names are *Dapatee lata,* (Hind.) *Ch'hagul khoori,* (Beng.) *Penlay ka zoon,* (Burm.) *Schovauna adamboe,* (Mal.) *Balabunda tiga, Choula pillar tiga.* (Tel.) Its long milky root is a strong purgative,(3) and is employed in this character in Brazil.(4) According to Plumier,(5) the inspissated juice constitutes a kind of scammony, bitter and nauseous to the taste, and purgative in doses of grs. xii,—xiv, conjoined with an equal quantity of the Bitartrate of Potash.

Neither of these two last named species appears to be employed as a purgative by the people of India ; but considering the family to which they belong, they may merit further attention.

Closely allied to the foregoing is the *Batatus paniculata*

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(1) Nat. Hist. of Jamaica i, p. 156.
(2) Flor. Med. Des. Antilles ii, p. 317.
(3) Browne Hist. of Jamaica, p. 153.
(4) Martin's Mat. Med. Bras. p. 79
(5) Plant. Amer. p. 89.

Batatas paniculata.
Bhooin Koomra.
(Hind. and Beng.)

of Choisy, (D. C. Prod. ix, p. 339,) *Convolvulus paniculatus* of Linnæus, (Sp. Pl. p. 223,) *Ipomœa paniculata* of R. Brown, (Prod. p. 486,) the *Pal moddecca* of Rheede. (Hort. Mal. xi, p. 101, t. 49.) It has numerous other botanical synonyms. Good figures of it will be found in Sims' Bot. Mag. t. 1790, in Andrew's Bot. Repository, t. 635, and in Ker's Bot. Register, t. 75. It is common throughout India, and is known by the names of *Vidaree*, (Sans.) *Bhooin, Koomra*, (Beng. and Hind.) *Matta-pal-tiga*, (Tel.) and *Ka-zwoon*. (Burm.) Its root, which is large and tuberous, is cathartic, and as such is used by the natives of the localities in which it grows. (Roxburgh.)

More important than either of the preceding is the *Pharbitis nil* of Choisy, (D. C. Prod. ix, p. 243,) *Pharbitis cærulea* of Wallich, *Convolvulus nil* of Linnæus, (Sp. Pl. 219,) *Ipomœa cærulea* of Roxburgh, (Flor. Ind. ii, p. 91, Ker. Bot. Reg. iv, tab. 276,) and *Ipomœa nil* of Roth. (Cat. Bot. 1, p. 36.) Its Eastern names are *Kālā-dana*, *Mirchi*, (Hind.) *Neel kulmee*, (Beng.) *Bounra*, (Kumaon.) *Kolli*, (Tel.)

Pharbitis nil.

كالا دانه

Kālā-dana.

This ornamental species, with its delicate blue flowers, extends over the greater part of Asia, and has been likewise introduced into the tropical portions of the Western hemisphere. The ripe seeds, *Kub-ul-nil*, (Arab.) *Kaladana*, (Hind.) have been proved to possess valuable cathartic properties. They are black, angular, weighing on an average half a grain each, in powder of a grey colour, of sweetish and subsequently rather acrid taste, and heavy smell. On analysis they yield resin, gum, starch, fixed bland oil, fibre, and colouring matter. The powdered seeds, in doses of 30 to 40 grains, act as a quick, safe, and pleasant cathartic. In 100 cases in which it was exhibited in the Police Hospital at Calcutta, it proved purgative in 94, occasioned vomiting in 5, and griping in 15, and produced on an average five stools within two hours and a half; the operation generally commenced in an hour, and was not in any instance delayed beyond four hours. The alcoholic extract, which consists of resin and oil, is deep brown, ductile, of excellent consistence, and keeps for several months. In 10 grain doses it produces all the effects of jalap, with certainty and speed

the taste is scarcely perceptible. Such is the experience of O'Shaughnessy,(1) to whom we are indebted for the introduction of this medicine.

Dr. Kirkpatrick(2) after employing this seed in between 500 and 600 cases, reports it a very valuable, safe, and certain purgative, intermediate in strength between rhubarb and jalap. He advises that the seeds should be boiled in water for three minutes, dried and reduced to a very fine powder, and given in one drachm doses. It should, he adds, be conjoined with a little ginger or omum water, and may be combined with cream of tartar like jalap; it is not, however, so apt to nauseate as the latter, and is not quite so active, though equally certain in its operation. To this we may add that the Madras Drug Committee reported very favourably of it, stating their opinion that the alcoholic extract is a safe and manageable cathartic, that the seeds are always procurable in the bazaar at a very cheap rate, and that the powdered seeds, being free from the nauseous taste and smell of jalap, give it some superiority over the latter article(3).

These statements confirm O'Shaughnessy's opinion, (op. cit.) that with this indigenous remedy the practitioner in India is independent in every respect of imported jalap, to which it is equal as a cathartic, and superior in portability and flavour.

The following formulæ are directed in the Bengal Pharmacopœia; 1, *Extract of Kaladana*; Powdered Kaladana seeds q. s. moisten with rectified spirit, exhaust the powder by percolation, distil off three-fourths of the spirit, and evaporate the rest on a water bath to a soft pillular consistence. Dose grs. 5 to 10.—2, *Tincture of Kaladana*; K. seeds bruised, 8 ounces; Proof spirit, two pints; prepare by percolation, or boil in half the spirit for 20 minutes, replacing what may be lost by evaporation, strain, and mix the rest of the spirit with the strained liquor. Dose, one to two drachms. —3, *Compound powder of Kaladana*; K. seeds finely powdered, Bitartrate of Potash of each, three ounces, Ginger two drachms. Dose grs. xx—xl.

Several plants of the large and widely diffused Natural order Leguminosæ are purgatives of established reputation. Of these the best known are the species of Cassia, which

(1) Beng. Disp. p. 505.
(2) Cat. of Mysore Drugs, No. 467.
(3) Madras Med. Reports 1858. p. 423.

yield the varieties of senna of commerce. Although one species at least, viz., *Cassia obovata* of Colladon, (Hist. des Cafes, p. 92,) the *C. Burmanii* of Wallich, is indigenous in many parts of South India, and although its leaves possess undoubted cathartic properties, yet it is from an exotic or imported species, *C. lanceolata* or *C. elongata*, that the so called Indian or Tinnevelly senna is obtained. Roxburgh, indeed, asserts that it is a native of the interior of India, and Graham(1) describes it as indigenous in Guzerat about Dholka; yet we find that Royle,(2) raised the senna plant at Saharunpore from seeds collected out of parcels of *Suna mukki*, or senna imported from Arabia into Calcutta, and it appears probable that the Tinnevelly senna was in the first instance raised by Mr. Hughes from imported seed. Some excellent practical remarks on the culture and preparation of Senna in India are published by Dr. Wight, in the Madras Journal of Literature and Science.(3) Tinnevelly senna being now an established article of the Materia Medica, it is needless in this place to enter on the consideration of its medicinal properties and therapeutic uses. Some few other species of Cassia require a brief notice.

Cassia obovata and other Senna yielding Cassias.

Cassia tora of Linnæus (Sp. Pl. 538, D. C. Prod. ii, p. 340—495,) *Senna tora* of Roxburgh, (Flor. Ind. ii, p. 340,) *Tagera* of Rheede, (Hort. Mal. ii, p. 53,) is a common Indian plant. *Chakwair* or *Chakour*, (Hind.) *Tagara*, (Tam.) *Tante puchettu*. (Tel.) Its mucilaginous and fetid smelling leaves are gently aperient, and are given in decoction in febrile affections of children during dentition. (Ainslie.)(4)

Cassia tora.

چکوندا یا چکونر

Chakwair.

2. *Cassia sophera* of Linnæus, (Sp. Pl. 543,) *Senna sophera* of Roxburgh, (Flor. Ind. ii, p. 347,) *Ponnam tagera* of Rheede, (Hort. Mal. ii, p. 101,) *Kasaundī*, (Hind.) *Kalkasoonda*, (Beng.) *Punavarie*, (Tam.) *Pydutangedu*, (Tel.) a low growing shrub of most parts of the East. The leaves, which have a fetid disagreeable

Cassia sophera.

کسوندی

Kasaundī.

(1) Cat. of Bombay Plants, p. 62.
(2) Mat. Med. p. 358.
(3) 1837 April, p. 358.
(4) Mat. Med. ii, p. 105.

odour, are stated by Horsefield(1) to be mildly cathartic. According to Rheede, (op. cit.) the leaves in decoction are administered by the people of Malabar, in jaundice and febrile affections, doubtless, with the view of obtaining their aperient effect.

3. *Cassia alata* of Linnæus, (Sp. Pl. 541,) *Senna alata* of Roxburgh, (Flor. Ind. ii, p. 349,) *Dād mardan* or *Daād-murden*, (Hind.) *Simie-agati*, (Tam.) is a large showy species throughout the tropical portions of both hemispheres. The leaves, in infusion or decoction, are said to act as a purgative, and in this character they are in use by the people of Panama, who know the plant by the name of *Lauremo*.(2)

Cassia alata.

داد مردن

Dād-mardan.

These three last named species enjoy also great repute as external applications in cutaneous diseases, and will be further considered hereafter.

Another well known purgative plant of this Natural order is the *Cathartocarpus fistula* of Persoon, (Ench. i, p. 459,) the *Cassia fistula* of Linnæus, (Sp. Pl. 540, Roxb. Flor. Ind. ii, p. 333,) the *Conna* of Rheede, (Hort. Mal. i, p. 37, tab. 22,) the *Amaltas* of the Taleef Shereef. (p. 17, No. 68.) Its Oriental names are *Sauvernaca Soovarunka*, (Sans.) *Khyar, Shimbar*, (Arab. and Turk.) *Phuloos*, (Pers.) *Amaltas, Kurwara*, (Hind.) *Sonaloo, Banur latigachh*, (Beng.) *Konnei*, (Tam.) *Rela, Rayla,-kaia*, (Tel.) *Cay-kay*, (Kanar.) *Conna*, (Mal.) *Gun-gyee*, (Burm.) *Aehaha, Aehœlaghas*, (Cing.) *Mentus*, (Malay.) *Toonggooli, Drangooli*, (Javan.) It is not to be confounded with the *Cassia fistula*, of the ancients, as by this name they designated those kinds of cassia or cinnamon which they received rolled up into fistulæ or pipes.(3) This elegant tree, the long racemes of gaudy yellow flowers of which justly entitle it to the name of "the Laburnum of the Tropics," is found in most intertropical parts of both hemispheres. It is chiefly valued for the sake of its pods, which contain a considerable quantity of black shining pulp, of a sweetish mucilaginous taste, and rather sickly odour. According to the analysis

Cathartocarpus fistula.

امالتاس

Amaltas.

(1) Journ. Asiat. Soc. vii, p. 493.
(2) Seeman in Hooker's Kew Garden Mix. iii, p. 264.
(3) See Adam's Commentaries on Paulus Ægineta Syd. Ed. vol. iii. p. 161.

of Henry,(1) it contains no less than 61 per cent. of sugar, and 6-7 of gum, besides colouring matter, gluten, &c.

Cassia pulp proves mildly laxative in doses of about ʒ ii, whilst it operates as a pretty active purgative when the dose is increased to ℥ i—℥ ii; but in these quantities it is apt to produce griping and flatulence. It is rarely given alone, but is usually conjoined with manna, the purgative effect of which it is said greatly to increase. The officinal Confectio Cassiæ is a good form for internal use, (Prepared Cassia lb. ss. Manna ℥ ii, Tamarind Pulp ℥ i, Syrup of Roses ℥ viii) in doses for adults ʒ ii—℥ i. As a general rule cassia pulp may be safely employed as an aperient for children and old persons, in the treatment of habitual constipation, and in other diseases where aperients are indicated; but it appears inadmissable where the patient is subject to flatulent colic, or where dyspepsia, characterised by debility of the digestive organs, is present. Many old writers, including Avicenna, Lösecke, Lewis, Boerhaave, and others,(2) speak of the effect of cassia pulp taken internally as communicating a green, or dark brown colour to the urine, but the fact was denied by Gmelin, Bergius, and later writers. The only modern authority who has mentioned the subject is Dr. Wight,(3) who advises that patients who take this remedy habitually as an aperient should be made aware of its colouring the urine of a dark brown colour, as in his own practice, he adds, some patients have refused to continue its use on the supposition, from the deepened colour of the urine, that it has a tendency to heat the system, and excite a bilious habit, even though at the same time they were otherwise deriving benefit from its use.

In addition to the pulp, medicinal properties have been assigned to other parts of this tree. The seeds are said to be purgative in doses of ʒ iv.—ʒ vi. (Colladon op. cit. p. 76) Similar properties have been assigned to the leaves,(4) and it has been said that the flesh of animals which feed upon them acquires a purgative property; but as Dujardin(5) justly remarks, the tree is generally too high to allow of animals feeding upon it.

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(1) Ann. de Chim. Med. vi, p. 275.

(2) See Murray's App. Medicaminum, vol. ii, p. 513.

(3) Illust. of Indian Bot. i, p. 195.

(4) Taleef Shereef, p. 17.

(5) Droques, p. 193.

Tamarindus Indicus.

املي

Amlī.

Very nearly allied to cassia pulp in its medicinal properties and uses is the sweetish acid pulp of the tamarind, *Tamarindus Indicus* of Linnæus, (D. C. Prod. ii, p. 488,) the *Balam-pulli* of Rheede, (Hort. Mal. i, t. 23,) the *Amli* of the Taleef Shereef, (p. 16, No. 63.) It is common throughout the tropics, and in the East is known by the following names. *Tintri, Tintiree,* (Sans.) *Temrhindee,* (Pers. and Arab.) *Amli, Amlie,* (Hind.) *Amlī, Tintooree, Tinti, Tentool,* (Beng.) *Chinta, chetu,* (Tel.) *Poolie,* (Tam.) *Mag-gee,* (Burm.) *Look-ma-kam,* (Siam.) *Asem,* (Javan.) *Asam-jawa,* (Mal.) *Hyabila, Mabasi-ambala.* (Cing.) The pleasantly acid pulp is a mild laxative; it is, however, rarely administered alone, but in conjunction with senna, manna, &c. It is thought to moderate the action of some of the resinous carthartics, but this is doubtful. Bontius(1) speaks of its being very useful in dysentery and cholera. It has been praised by Aublet(2) as an antiscorbutic, under which heading it will be further considered. Aperient properties are also assigned in the Taleef Shereef(3) to the flowers of the tamarind tree; and Burman(4) states that in the form of conserve they prove useful in affections of the stomach, liver, and spleen.

Alhagi maurorum.

جواسا

Jawāsā.

The next Leguminous plant which calls for notice is the *Alhagi maurorum* of Tournefourt, (D. C. Prod. iii, p. 253,) the *Alhagi manifera* of Desvaux, the *Hedysarum alhagi* of Linnæus. (Sp. Pl. 1053, Roxb. Flor. Ind. iii, p. 344.) It is an erect thorny shrub, inhabiting Egypt, Syria, Mesopotamia, and Scinde; also the banks of the Jumna and Ganges in Upper India, Guzerat, and the south Maharatta country. Its Eastern names are *Yasa, Yavasa,* (Sans.) *Jawāsā, Javansa, Ooshturkah,* (Hind.) *Juvasa,* (Beng.) It deserves notice in this place as yielding a kind of manna called in Arabic *Toorunjbeen,* which is imported into India from Cabul and Khorasan. It has been thought by some to be the manna of the Old Testament, but this is more than doubtful, as it is stated to have been produced in

(1) Diseases of India, &c., p. 201.
(2) Plant Guian, p. 24.
(3) Op. cit.
(4) Thes. Zeylan, p. 222.

abundance for millions where hundreds cannot now be sustained.(1) The substance *Toorunjbeen* or *Manna of the Desert*, as it is sometimes called, occurs in small, round, unequal grains, the size of coriander seeds, of yellowish or white colour, caking together and forming an opaque mass, in which are found portions of the thorns and fruit of the plant; it is inodorous, with a saccharine taste, followed by slight acridity. As a medicine, its effects correspond to those of the Ash manna. No good analysis of it has been made. (Beng. Disp. p. 296.) In the Taleef Shereef (p. 72.) *Janansa* is described as cool, light, and aperient, useful in bilious disorders.

Tamarix gallica, var. Indica.

جھاؤ

Jhā'ū.

Though not belonging to the same Natural order, this seems an appropriate place to notice another Indian Manna bearing plant. *Tamarix gallica*, var. *Indica*, Ehrenb, (Wight's Illust. i, t. 24. Roxb. Flor. Ind. ii, p. 100.) It is a small shrub *Jhā'ū*, (Hind. and Beng.) found chiefly on the banks of the Indus, Cutch, and Scinde, the banks of the Jumna and Ganges, and on the Coromandel Coast. It yields a species of manna called *Arabian Manna*, or *Manna of Mount Sinai*. It is the *Guz-ungu-been* of the Ulfaz Udwiyeh (No. 1296). Prof. Royle(2) mentions that five kinds of manna are met with in India; 1, the best, called *Sheerkhisht*, is said to be procured from a tree in Khorasan, probably belonging to the Oleaceæ. 2, *Toorunjbeen*, the produce of *Alhagi maurorum*. 3, *Guzunjbheen*, of a *Tamarix*. 4, *Shukhr-ool ashur* of *Calotropis procera;* and 5, one kind obtained from an Umbelliferous plant.(?) Manna is rarely employed by the Hindu doctors, but the Mussulmans understand its use, and prescribe it as a laxative. It is very rarely obtainable in the bazaars of Southern India, and then of a very inferior quality.

Clitorea ternatea.

اپراجتا

Aparājitā.

The next Leguminous plant in our list is the *Clitorea ternatea* of Linnæus, (Roxb. Flor. Ind. iii, p. 321,) the *Flos cœruleus* of Rumphius, (Herb. Amb. v, p. 56, tab. 31,) the *Apurjeeta* of the Taleef Shereef (p. 7, No. 17.) It is a well known elegant creeper,

(1) See Kitto Cyc. of Biblical Lit. vol. ii, p. 293. An excellent paper by Dr. O'Rorke on the Manna of the Hebrews, identifying it with the *Lichen esculentus* of Pallas will be found in the Pharmaceutical Journal, Sept. 1st 1860, p. 169, from Journ. de Pharm. et de Chimie, June 1860.

(2) Illust. i, p. 267.

constantly found in gardens, and valued for the sake of its ornamental blue flowers. Its Eastern names are *Aparajita*, (Sans.) *Aparajita*, *Kawwathenthi*, *Neelaghiria*, (Hind.) *Neeluparajita*, *Blue var*, *Shwet uparajita*, *White var*, (Beng.) *Karkakartan codie*, (Tam.) *Nulla-ghenatnacodie*, *Nulla dintena*, (Tel.) *Shlongo-kuspe*, *Shunkú-pushpa*, (Mal.) *Oung mai-phyoo*, (Burm.) *Katarodu*. (Cing.) There are two varieties, one with white and the other with blue flowers; the former is supposed to possess the greatest amount of medicinal activity. Burman, in his Thesaurus Zeylanica (Ed. 1737 p. 100) is the first writer I have met with, who distinctly mentions the aperient properties of the seeds. In doses of two drachms, he states that they prove gently laxative. The Madras Drug Committee state that favourable accounts of the efficacy of *Clitorea* seeds as a purgative have been received by them, but it having been discovered, that by mistake, the seeds of *Pharbitis nil* had been supplied by the Commissariat, on one occasion at least, they exercise a wise discretion in deferring to publish the opinion which they had formed. The root appears likewise to partake of this property. O'Shaughnessy(2) found that the alcoholic extract of the root, in doses of 5—10 grains, acted as a brisk purgative. But griping and tenesmus were so often produced during its operation, the patient, at the same time, being feverish and uneasy, that, he adds, he cannot recommend its employment.

Poinciana pulcherima.

كرشن چرن

Krishna charan.

The last indigenous Leguminous plant which we shall specify is the *Poincianna pulcherima* of Linnæus (Sp. Pl. 544, Roxb. Flor. Ind. ii, p. 355,) a handsome flowering shrub common in gardens, and known to English residents by the name of *Barbadoes or Peacock's Pride*, and *Barbadoes Flower fence*. Its Oriental synonyms are *Krishna-choora*, (Sans.) *Krishna charan*, (Beng. and Hind.) *Gul-i-turra*, (Pers.) *Komri*, (Tam.) *Doung-souk*, (Burm.) *Monara-mal*, (Cing.) It does not appear to be employed in the East as a purgative, but it is so in tropical America and the West Indies, whither it has been transplanted with great success. Thus Martins,(3) speaking of the plant as grown in Brazil, states that the

(1) Madras Med. Reports 1855, p. 423.
(2) Beng. Disp. p. 315.
(3) Mat. Med. Bras, p. 75.

leaves produce a cathartic effect approaching to those of *Colutea arborescens;* and he adds that horses and mules which eat them are liable to be attacked with colic and dysentery. Dr. Barham(1) states that Sir Hans Sloane classed it with the Bastard sennas; indeed, he adds, that when dried and old it is very difficult to distinguish one from the other, and as for virtues, he states that it possesses the same as those of the Alexandrian senna: as the plant is very common in India, it may be worth further trials. Lunan(2) states that the powdered seeds, in doses of a drachm, give more ease in dry bellyaches, more so indeed than opiates or any other known medicine, being not in the least unpleasant to the taste, giving quick relief, and making way for gentle laxatives to be administered.

We must now direct our attention to the Rhubarb yielding plants of India. These, which belong to Natural order Polygonaceæ, are confined, as far as we at present know, to the mountainous regions of the Northern portions of the Continent, and may be classed as follows.

Rheum emodi and other Rhubarb yielding species.

1. *Rheum emodi,* Wallich, Cat. E. I. Herb. No. 1727; Hooker, in Bot. Mag. t. 3508; Lindley, Flor. Med. p. 354. *D. Australe,* Don. Prod. Flor. Nepal, p. 75. This species is found on the Himalayas to 16,000 feet elevation (Gerard) as far as the confines of Tartary (Webb.), Ladak 37° N. Lat. (Moorcroft), Kumaon to 10,000 feet in 31° to 40°. N. Lat. (Blinkworth), Gosaingo and in Nepal. (Wallich.)

2. *Rheum Moorcroftianum,* Royle, Illust. p. 318; Wallich, op. cit. No. 1727, "*Small stalked Rhubarb*" inhabiting the Niti Pass in the Himalayas, at 12,000 feet elevation. Roots called *Dooloo* in Bootan.

3. *Rheum spiciforme,* Royle, Illust. p. 318, t. 78; found on the Northern face of the Himalayas, at Kherang Pass and several places beyond.

4. *Rheum Webbianum,* Royle, Illust. p. 38; *R. emodi,* Meisner, in Wallich Plant. Asiat. Rar. iii, p. 65. (not Wallich.)

These four species are supposed to yield the greater portion, if not the whole of that variety of Rhubarb which is so well described by Pereira(3) under the name of *Himalayan rhubarb, Radix rhei Himalayanensis, Radix rhei Indici.*

(1) Hort. Americana, p. 16.
(2) Hort. Jamaicensis, i, p. 52.
(3) Mat. Med. ii, p. 1353.

This author considers that what he terms the larger Himalayan rhubarb is the product of *R. emodi*, whilst the smaller variety is that of *R. Webbianum*. It is the latter kind apparently that Twining, quoted below, employed in his experiments, although it should be observed that Twining himself mentions that he employed the root of "*Rheum emodi* of Wallich."

Twining, in his work on the Diseases of Bengal,(1) remarks that the root of the *R. emodi* is remarkable on account of its loose structure compared with the rhubarb of commerce. The powdered root is described as of a brownish colour, possessing less of the peculiar aroma of *R. palmatum*, and being more astringent to the taste, leaving a strong flavour on the tongue, similar to that of bitter almonds. It tinges the urine, when administered internally, of a very deep colour; it is less disagreeable to take than Turkey rhubarb, less efficacious in large doses as a purge, very rarely producing griping, but much more effectual as a tonic and astringent in the cure of intestinal profluvia. He adds (p. 221) that he knows of no remedy which has proved so useful in the treatment of chronic diarrhœa, when that disease is accompanied by enlarged spleen. The most obvious effects of this remedy are a gradual but prompt decrease of the purging, and an improved appetite and digestion, without any heat or febrile symptoms. The dose is five grains, twice a day. In cases where there is much debility, great benefit is derived from administering some of the decoction or extract of Goluncha *(Cocculus cordifolius)* in the middle of the day, at the same time that five grains of the powdered Rheum emodi are given night and morning. In the Third volume of the Trans. of the Med. and Phys. Society of Calcutta (p. 443.) Mr. Twining details 43 cases in which this drug was administered; the results are very similar to the remarks quoted above. He adds that in doses of ℈ i. to 3 ss.(2) it has a good purgative effect, operating three or four times nearly as freely as the best Turkey rhubarb. It is probably the *Rewind* of the Taleef Shercef, p. 89, No. 520.

For further information on this species of rhubarb consult Don in Jameson's Journal, March 1829, Edin. Med. and Phys. Journ. No. 96, July 1823, p. 168; Nees et eber, op. cit. and in Journ. de Pharm. 1827, vol. xiii, p. 344; Royle's

(1) Vol. ii, p. 220.

(2) By a typographical error in the Bengal Dispensatory (p. 519) the dose is placed at two or three drachms.

Journ. Asiat. Soc. of Calcutta, No. 2, Feb. 1832, p. 13; and Mat. Med. p. 521.

The Oriental synonyms of the rhubarb root are *Rewand*, (Arab., Pers. and Hind.) *Variatoo, Kalung*, (Tam.) *Ta-hwang*, (Chin.) *Tai-hoang*, (Coch-Chin.) *Pom bechal, Nerr* (Cashmere.) *Rawond* (Turk.)

A few plants not belonging to either of the preceding Natural orders remain to be considered.

1. *Aloe Indica*, Royle, (Illust. p. 390,) *Aloe perfoliata*, Roxburgh, Flor. Ind. ii, p. 167,) *Kanwar*, (Duk.) *Gheekoomar* (Hind.) *Ghrito komaree*, (Beng.) *Kareybolam*, (Tam.) and *Yarra kalabunda*. (Tel.) This species, with large red flowers, is common in dry localities in the North Western Provinces of India, and is commonly met with in gardens under the name of the *Indian aloe*. O'Shaughnessy(1) considers that it is probably the source of some of the common aloes of the bazaars of India. According to Pereira(2) a portion of the Indian aloes of commerce is the produce of this plant.

Aloe Indica.

گھیکنوار یا کنوار

Kanwār Ghīkanwār.

Closely allied to this species, if not identical with it, is the *Aloe litoralis* of Köenig, (Ainslie, Mat. Ind. ii, p. 169,) which is common on dry arid soils near the sea coast, in many parts of the Peninsula of India. Its vernacular names are *Chota kanwār*, (Hind.) *Koomaree*, (Beng.) *Kattazhei*, (Tam.) and *Chinie Kalabunda*. (Tel.) Whilst staying at Cape Comorin, in 1853, I obtained a considerable quantity of the thick mucilaginous juice of this plant, and by inspissating it in the sun, I obtained some ounces of excellent aloes, far superior to any obtainable in the bazaars, which, in the few cases I experimented with it, proved actively purgative, in the doses in which the aloes of commerce is usually administered; and I feel no doubt that an excellent and efficient kind of aloes might be prepared from it, in considerable quantities, in the hands of an enterprising native or European. Though not employed as a purgative by the natives of Travancore, the fresh juice is in universal use as a local cooling sedative application to many inflammatory affections of the skin, &c. We may have occasion to allude to this hereafter.

Aloe litoralis.

چھوٹا کنوار

Chota kanwār.

(1) Beng. Disp. p. 665. (2) Mat. Med. i, p. 1081.

Previous to 1845, it was not known that gamboge was one of the produets of India; but in that year Dr. Hugh Cleghorn, of the Madras Medieal Service, forwarded to Prof. Christison[1] eertain specimens of gamboge from Mysore, whieh, on analysis, proved to be even superior as a medicinal agent to the best Siam gamboge; the per eentage of resin, the aetive prineiple, in the latter, ranging from 71 to 74 per cent.; whilst in that from Mysore, it ranged from 77 to 80. The tree whieh yields it, the *Garcinia pictoria* of Roxburgh, (Flor. Ind. ii, p. 627; Wight's Icones ii, tab. 102,) the *Xanthochymus pictorius* of Roxburgh, (Coromandel Plants, p. 51, t. 196,) the *Hebradendron pictorium* of Graham? is found along the whole line of Ghats in Canara and Mysore, also in Assam, the Tenasserim Provinces, &e. Its vernaeular names are *Goorgeemara*, (Canar.) *Mukkie marum*, (Tam.) *Tha-rat-dau.* (Burm.) It is worthy of remark that the natives themselves were totally ignorant of the purgative properties of its yellow exudation, gamboge. Ample experienee has now proved that it produces all the hydrogogue effeets of the best Siam gamboge. Dr. Hugh Cleghorn[2] furnishes some good tabular returns of the eases in whieh he employed it. In sixteen eases in whieh the gum resin was given, (uneombined,) all the irritant properties of the drug were manifest, for vomiting was twiee produeed, and more or less of tormina followed in three instanees. In one ease only there was no effeet. In twenty-nine other cases in whieh three or four grains of the gamboge were given, in combination with ten or twelve grains of eream of tartar, neither vomiting nor hypereatharsis was produeed; in one ease only slight griping was complained of, and this ceased when the cathartic took effect; in two there was no motion after the first dose, but full evaeuations when the remedy was repeated. From these, and the reeorded observations of others, Dr. Cleghorn draws the eonelusion that the mixture of gamboge and eream of tartar is a eheap and eonvenient hydrogogue, whieh might with perfeet safety be substituted for the eompound jalap powder, espeeially when we desire to evacuate the watery aeeumulation of anasarea, or to give a brisk purgative in cases of enlarged spleen and liver. Dr. Alexander Hunter, Dr. F. Arthur, and Dr. J. Kellie, of the Madras Medieal Serviee, have borne similar testimony.[3]

Garcinia pictoria.
Goorgeemara. (Can.)

(1) Pharm. Journ. 1847, vol. vi, p. 60. (2) Mad. Med. Rep. 1855, p. 433.
(3) See Mad. Med. Rep. 1855, p. 431.

The *Mirabilis jalapa*, (Linn. Sp. Pl. 252,) a plant well known to Europeans by the names of *Marvel of Peru*, or *Four o'clock*, (from the fact of its flowers opening at that hour,) was originally a native of Peru, but is now completely naturalized in all parts of India, where it is known by the names of *Abbas*,(Arab.) *Gul' abbasi*, (Pers.) *Abbās*, *Abbasie*, (Hind.) *Kishno-keli*, (Beng.) *Partrashi*, (Tam.) *Myae-zee*, (Burm.) *Sindrikhan*, (Cing.) *Rambul-pokul-ampat*. (Mal.) That the root, which has a nauseous bitter taste, possesses purgative properties is, I believe, undoubted; indeed at one time it was thought to be the true jalap of commerce, an idea, however, which is now exploded. In the Taleef Shereef (p. 110) the root is spoken of as a mild and efficient purgative, equal if not superior to the common jalap. Drs. Hunter and Shoolbred, quoted by Fleming,(1) and likewise Ainslie,(2) consider that its purgative virtues are not sufficient to entitle it to any consideration, and O'Shaughnessy(3) believes, as the result of his own experience, that this root is destitute of any efficacy, or is at the best an uncertain cathartic. An alcoholic extract, prepared from the root, in doses of 40 grains, is stated by Coste and Willement(4) to produce six motions. From these statements it is evident that this root is a poor and uncertain substitute for the true jalap; still it may be employed in cases of emergency. Dr. Ives(5) mentions that he gave it in twice the quantity of the ordinary jalap; but, he adds, as it grows wild in some parts of India, an equal quantity of the wild sort is sufficient.

Mirabilis jalapa.

عباس

Abbās.

Terminalia chebula of Retz. (Roxb. Corom. Plants, t. 197,) *Terminalia reticulata* of Roth, *Melanoxylon Cadika-marum* of Köen; a large tree of the Natural order Combretacea, extending from the Peninsula and Ceylon, to Assam, Nepal, and Burmah; commonly known by the names of *Hariatka*, (Sans.) *Harā*, *Hur*, *Harua*, (Hind.) *Hareetukee*, (Beng.) *Karaka chettu*, (Tel.) *Kadukai marum*, (Tam.) *Kya-zas*, (Burm.) *Arooloo*, (Cing.)

Terminalia chebula.

هرا

Harā.

Its ripe fruit is the true *Chebulie*, or *Yellow Myrobalum*

(1) Cat. Ind. Med. Pl. p. 29.
(2) Mat. Ind. ii, p. 285.
(3) Beng. Disp. p. 512.
(4) Merat & Delens Dict. iv, p. 430.
(5) Voyage to India, &c., p. 463.

of old writers, the *He-lee-luj* of the Ulfaz Udwyeh, (No. 1423,) and the *Hurr* of the Taleef Shereef.(1) It is well known by its Tamul name *kadukai*, and is well figured by Guibourt in his Hist. des Droques Simp.(2) As met with in the bazaars, the fruit is about the size of a large Spanish olive, of an oblong ovate shape, yellow brown colour, and marked with five edges and five furrows alternately. It is generally regarded as astringent, but notwithstanding this, it possesses purgative properties of no mean value. Some few years since I made trial of the common *kadukai* of the bazaars, having been informed on excellent authority that its operation was mild and effectual. It was tried in 36 cases; to 12 it was given reduced to powder, in electuary with jaggery; to 12 in decoction, and to 12 in simple infusion. The powdered nut in doses of 3 ii. produced from three to six copious watery stools, with no vomiting in any cases, and griping in only two. The infusion (six fruit bruised and infused in ℥ iv. of boiling water,) proved very unsatisfactory; in one instance it had no effect; in four it produced only one small consistent stool, and in no case did it operate more than three times. With the decoction the results were most uniform and satisfactory. I found that six kadukai bruised and boiled in ℥ iv. of water, produced on an average from three to five copious stools, not watery but loose, and in no instance was there griping, vomiting, or any other ill effects whatever. Their action seemed prompt and effectual. The addition of a little cinnamon rendered the medicine more palatable. These *kadukai* are procurable at a nominal price throughout India, and where other aperients are not available, may be resorted to with safety.

The unripe fruit is the *Zengi-bar* or *Jungeia* and *Hyur-haritakee* of the Hindoostanees, the *Black myrobalan* of old writers; some excellent remarks on its properties and uses by Rajah Kalikissen were published in the Calcutta Medical and Physical Transactions.(3) It is, he remarks, a mild purgative slightly carminative and tonic, and is given in many chronic complaints with much advantage. It is said to remove obstructions, improve the general health, strengthen the digestion, relieve bilious and hypochondrical affections, and to "increase the happiness of life!" A regular course of this medicine is prescribed for this purpose, and it is recommended to be continued for several months. Its efficacy is

(1) P. 175, No. 1032. (2) Vol. iii, p. 262, t. 323. (3) Vol. v, p. 432.

much extolled. As an aperient the usual dose is two grains with ten grains of black salt *(Kala nemuch)* every morning. Twining(1) advices a somewhat similar formula in spleen affections, but he raises the dose of the myrobalan to ʒ ss. He speaks very favourably of the remedy; it is according to him a mild and rather warm purgative, which is tolerably certain in its effects as an aperient, and possesses very considerable tonic properties. It has been found useful in some chronic visceral diseases attended with debility, where mercury did not act favourably. It is surprising, he adds, that a medicine with such useful properties, should be so little employed in many of the cachexiæ that prevail in low and damp situations in Europe.

Terminalia citrina.
Harā. (Hind.)

There is another closely allied species, *Terminalia citrina,* (Roxb. Flor. Ind. ii, p. 435; D. C. Prod. iii, p. 12,) common in Assam, the Khassya mountains, and other parts of India, where it is known by the names of *Liba,* (Sans.) *Harā,* (Hind.) *Alay-gara,* (Canar.) Its fruit, which much resembles that of the preceding species, is stated in the Bengal Dispensatory (p. 340) to be a gentle purgative. Its action cannot be very strong, as it is often made into pickles by the natives.

Argemone Mexicana.
بھربھانڈ
Barbānd.

Argemone Mexicana, (Linn.; D. C. Prod. i, p. 120. Wight's Illust. i, tab. 2.) The *Jamaica* or *Mexican Thistle,* a well known plant of the Natural order Papaveraceæ, originally a native of the West Indies, but now completely naturalized in all parts of the East. It is found chiefly on rubbish heaps near towns and villages, and is easily recognized by its yellow poppy like flowers, its whitish veined leaves, and spinous fruits. Its Oriental names are *Bramhi, Brumadandie,* (Sans.) *Bhaband, Berumdundie,* (Hind.) *Buro-shelkanta,* (Beng.) *Feringadatura,* (Can.) *Baramadandu,* (Tam. and Tel.) The seeds, on expression or coction, yield a fixed oil, which in the West Indies enjoys considerable repute as a purgative. Mr. E. Huggins, of Nevis,(2) Dr. Michael Short,(3) Dr. W. Hamilton,(4) Dr. Mudie, and others, have testified to its value as a

(1) Diseases of Bengal, vol. i, p. 407.
(2) Lond. Med. Bot. Trans. Nov. 9th 1827, p. 1.
(3) Ibid. p. 3.
(4) Lond. Pharm. Journ. iv, p. 169; ix, p. 129, xii, p. 292.

mild and efficient aperient; its action being attended with a sedative operation; it is particularly vaunted as a remedy in the dry belly ache of the West Indies. Whether the plant has had its virtues modified or lost by transplantation to the East, is uncertain; but O'Shaughnessy(1) instituted some experiments with the East Indian grown plant, and though he administered the oil in ounce doses, it failed to produce any purgative effect. Powerful narcotic effects were attributed to these seeds by early writers; indeed Barham(2) regarded them as stronger than opium; but from the descriptions given by these writers, it appears to me evident that they often confounded the fruit with that of Datura.

The following list comprises the names of other reputed purgative plants, indigenous or naturalized in India.

Name.	*Part used.*	*Authority.*
Agati grandiflora	Leaves	Bengal Disp. p. 296.
Alangium hecapetalum	Root juice	Wight Illust. Ind. Bot. ii, p. 2.
Allamauda cathartica	Leaves	Lindley Flor. Med. p. 533.
Anisomeles Malabarica	Flowers	Irvine Mat. Med. of Patna, p. 30.
Argyrea Malabarica	Root	Graham Bombay Pl. p. 128.
Aristolochia bracteata	Leaves	Ainslie Mat. Ind. ii, p. 5.
Balanites Ægyptiaca	Pulp of fruit	Wight Illust. i, p. 101.
Basella rubra	Leaves	Horsefield Journ. As. Soc. vii, p. 265.
Boerhaavia diffusa	Root	Ainslie Mat. Ind. ii, p. 205.
Bryonia epigœa	Root	Ibid vol. ii, p. 158.
Bryonia scabra	Shoots	Ibid vol. ii, p. 213.
Calotropis gigantea	Juice	Bengal Disp. p. 453.
Cardiospermum Halicac.	Root, Leaves.	Ainslie ii, p. 204. Kirkpatrick Cat. No. 279.
Carthamus tinctorius	Seeds	Taleef Shereef, No. 732.
Cavalium urens	Seeds	Roxb. Flor. Med. iii, p. 145.
Cerbera manghas	Leaves	Horsefield (op. cit.) vii, p. 262. Wight Illust. ii, p. 161.
Dais octandra	Seeds	Horsefield (op. cit.) vii, p. 493.
Ficus carica	Ripe Fruit	Lindley Flor. Med. p. 298.
Gardenia campanulata	Fruit	Roxb. Flor. Ind. ii, p. 557.
Herpestris Mounicra	Root Leaves.	Ainslie Mat. Ind. ii, p. 239.
Lagenaria vulgaris	Wild Fruit	Royle Illust. i, p. 218.
Lepidum sativum	Seeds	Ainslie Mat. Ind. vol. i, p. 95.
Morinda citrifolia	Fruit	Irvine Jour. As. Soc. Beng. 1839, p. 894.
Moringa pterygosperma	Oil of Seeds.	Merat et DeLens Dict. Mat. Med. iv,
Myrsine bifaria	Fruit	Royle Illust. i, p 266. [p. 481.
Pavetta Indica	Root	Ainslie Mat. Med. ii, p. 289.
Plumeria acutifolia	Root	Horsefield Asiat. Journ. vii, p. 493.
Prianthema obcordata	Root	Taleef Shereef, p. 38. Ainslie ii, p. 370.
Salvadora Indica	Leaves	Beng. Dis. p. 527. Roxb. Illust. i, p. 319.
Thevetia Neriifolia	Bark	Merat et DeLens. Dict. Mat. Med. ii, p. 182.

(1) Beng. Disp. p. 183. (2) Hort. Amer. p. 152.